UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,909	10/30/2003	Jongmo Sung	51876P397	9718

8791 7590 10/20/2008

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

EXAMINER	
KOVACEK, DAVID M	

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
10/20/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/697,909	SUNG ET AL.	
	Examiner	Art Unit	
	David Kovacek	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *3* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/10/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is response to applicant's Amendment, filed 07/10/2008, in which the applicant amends **claims 1-2**, **6** and **8-9**, provides arguments for patentability over the cited prior art, and cancels **claim 3**.

Response to Amendment

2. The applicant's amendments to **claims 2** and **6** with respect to the correction of minor formalities in each claim have been considered and are accepted. It is noted by the examiner that formal acceptance of the conditions of the claims is not an indication of allowability of the claims over the prior art. Appropriate rejections are included in this Office Action in the relevant sections below.

3. The applicant's amendments to **claims 1** and **8-9** have been considered and are accepted. It is noted by the examiner that the current amendments substantially change the scope of the limitations of the claims as previously presented. It is noted by the examiner that formal acceptance of the conditions of the claims is not an indication of allowability of the claims over the prior art. Appropriate rejections are included in this Office Action in the relevant sections below.

Response to Arguments

4. Applicant's arguments with respect to claims **1-5** and **8-9** have been considered

but are moot in view of the new ground(s) of rejection. It is noted by the examiner that the current amendments substantially change the scope of the limitations of the claims as previously presented.

The applicant's arguments directed to **claim 1**, submitted in the Remarks of 07/10/2008, are largely supported by the inclusion of new limitations in **claim 1**. The applicant contends that the cited teachings of the prior art do not adequately disclose the excitation parameter translating means to receive the frame rate-corrected formant parameters from the formant frame rate converting means before the translated formant parameters are quantized by the formant parameter quantizing means, the excitation parameter translating means further to convert the frame rate-corrected formant parameters to generate converted parameters, to interpolate the converted parameters by weighing sub-frames to generate interpolated parameters, and to construct a corresponding perceptual weighing filter by using the interpolated parameters.

Specifically, the applicant contends that "Dejaco (US Patent 6,260,009; cited previously) does not disclose that the excitation parameter translator 630 receives frame rate-corrected formant parameters before the translated formant parameters are quantized [emphasis in original] (Page 9, paragraph 01)." It is first noted by the examiner that **claim 1** is rejected based upon a standard of obviousness, and not anticipation. The teachings of

Dejaco include both an excitation parameter translator (Col. 7, lines 04-08), and a formant parameter quantizer (Col. 6, line 66 – Col. 7, line 04). The order of the operations for the translation and quantization is not known to be a relevant factor in the direct results of either the current invention, or the teachings of Dejaco. The examiner contends that one of ordinary skill in the art could rearrange the order of operations to obtain predictable results. One of ordinary skill would have the motivation to attempt to rearrange the order of the operations for the purpose of determining a configuration of the invention which results in an optimal processing speed. Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art to implement the teachings of Dejaco in an alternate order of operations in order to realize the optimal processing implementation.

The applicant later argues that "Kao (US Patent 5,371,853; cited previously) does not disclose that the perceptual weighting filter is constructed with the interpolated parameters obtained from the interpolated and converted frame rate-corrected formant parameters (Page 9, paragraph 03)."

However, the examiner notes that the teachings of Kao includes a perceptual weighting filter implemented as a convolution of an impulse response generated with respect to data correlated to a speech signal, analogous to formant parameters [residuals] (Col. 6, lines 10-15, lines 32-37). It is further noted that the features of interpolated and converted frame rate-corrected formant

parameters are directly addressed within the primary reference of Dejaco, as previously applied to **claim 1**.

For at least these reasons, the provided arguments are found to be non-persuasive.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. **Claims 1-2**, and **4-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejaco in view of Cho, in further view of Arslan, and in further view of Koa.

Regarding **claim 1**, Dejaco discloses an apparatus for trans-coding between CELP type codecs having different bandwidths, comprising:

- a first type converting means for receiving formant parameters from the input bit stream and converting formant parameters from the type specified in the input CELP format to a suitable type for a formant bandwidth conversion (Fig. 6, item 610A; Fig. 7, item 702; Col. 7, lines 11-14);

- a formant parameter translating means for translating formant parameters from input CELP format to output CELP format and generating translated formant parameters in an output CELP format (Fig. 5, item 502; Fig. 7, item 702; Col. 2, lines 45-49; Col. 7, lines 16-19);
- a formant parameter quantizing means for receiving the translated formant parameters and quantizing the translated formant parameters (Fig. 5, item 506; Fig. 7, item 712; Col. 2, lines 45-49; Col. 6, lines 55-57; Col. 7, lines 16-19);
- an excitation parameter translating means for translating excitation parameters from input CELP format to output CELP format and generating excitation parameters in an output CELP format (Fig. 6, item 630; Col. 2, lines 49-53; Col. 6, lines 04-08); and
- an excitation quantizing means for receiving the translated excitation parameters and quantizing the translated excitation parameters (Fig. 5, item 506; Col. 6, lines 60-62).

Dejaco further renders obvious the limitation of the excitation parameter translating means to receive the frame rate-corrected formant parameters from the formant frame rate converting means before the translated formant parameters are quantized by the formant

parameter quantizing means. The order of the operations for the translation and quantization is not known to be a relevant factor in the direct results of the teachings of Dejaco. The examiner contends that therefore one of ordinary skill in the art could rearrange the order of operations to obtain predictable results. One of ordinary skill would have the motivation to attempt to rearrange the order of the operations for the purpose of determining a configuration of the invention which results in an optimal processing speed. Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art to implement the teachings of Dejaco in an alternate order of operations in order to realize the optimal processing implementation.

Dejaco does not adequately disclose that the formant parameter translating means includes a formant bandwidth converting means.

Cho discloses a pitch determination apparatus that includes a formant bandwidth conversion [extension] unit (Fig. 2, element 210; Col. 1, line 61 – Col. 2, line 05; Col. 2, lines 63-65) for the purposes of extending formant bandwidth.

Dejaco in view of Cho does not adequately disclose the bandwidth converting means for compressing formant bandwidth.

Arslan discloses formant bandwidth compression [reduction] by direct adjustment of line spectral frequencies (Col. 9, lines 01-03) for the use in transcoding ("transforming a source signal into a target signal"; Claim 1).

Kao further discloses interpolation of parameters to construct a corresponding perceptual weighing filter [generating impulse responses for perceptual weighting filter based on correlated input speech data] (Col. 6, lines 10-15, lines 32-37).

These references are combinable because each is directed to a method of speech data analysis and also to encoding speech. Further, Cho provides motivation to combine in disclosing the utility of formant bandwidth extension in reducing the influence of a first formant, thus yielding a more accurate analysis (Col. 1, line 62).

Arslan further provides motivation in disclosing the usefulness of compression of formant bandwidth to remove audible buzz artifacts caused by overly-expanded formant bandwidths (Col. 8, lines 58-61).

Koa provides further motivation in disclosing the need for reduced complexity of processing the excitation parameters of a CELP-type codec (Col. 3, lines 42-45).

Therefore, the examiner contends that it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Dejaco in view of Cho to implement an apparatus for trans-coding between CELP type codecs including a formant bandwidth conversion device used for reducing the influence of a first formant in speech data, and to further use the teachings of Arslan to remove audible buzz artifacts caused by overly-expanded formant bandwidths, and to further still use the teachings of Koa to reduce the complexity of processing the excitation parameters of a CELP-type codec.

Regarding **claim 2**, Dejaco in view of Cho and in further view of Arslan discloses all limitations of **claim 1** as applied above and Dejaco further discloses:

- a formant model order converting means for receiving the input formant parameters from the second type

converting means and converting the formant parameters from the model order in the input CELP format into the model order in the output CELP format (Fig. 7, item 704; Fig. 6, item 602);

- a third type converting means for receiving the order-corrected formant parameters from the formant model order converting means and converting the formant parameters from the type used in the model order converting means to a suitable type for frame rate conversion (Fig. 6; item 610B);
- the formant frame rate converting means for receiving the input formant parameters from the third type converting means and converting the formant parameters from the frame rate in the input CELP format to the frame rate in the output CELP format (Fig. 7, item 708); and
- a fourth type converting means for receiving the frame rate-corrected formant parameters from the formant frame rate converting means and converting the formant parameters from the type used in the formant frame rate converting means to a suitable type for the formant parameter quantizing means in the output CELP format (Fig. 6, item 610C).

Though Dejaco in view of Cho and in further view of Arslan does not explicitly disclose a second type converting means for bandwidth-conversion, this limitation is inherently required of any system that permits transcoding between codecs of different bandwidths, such as the system disclosed by the teachings of Dejaco in view of Cho, and in further view of Arslan.

Regarding **claim 4,** Dejaco in view of Cho and in further view of Arslan discloses all limitations of **claim 2** as applied above, and Dejaco further discloses the use of truncation and extension for model order correction (Col. 7, lines 30-41).

Regarding **claim 5**, Dejaco in view of Cho and in further view of Arslan discloses all limitations of **claim 2** as applied above, and Dejaco further discloses the use of interpolation and decimation for adjusting frame rates (Col. 7, line 63 – Col. 8, line 08).

Regarding **claim 6**, Dejaco in view of Cho, and in further view of Arslan discloses all limitations of **claim 2** as applied above, and Dejaco additionally discloses an excitation parameter translator that includes an excitation synthesizing means (Fig. 6, item 606; Col. 8, lines 25-31) and a codebook searcher (Fig. 6, item 608; Col. 7, lines 07-08; Col. 8, lines 32-34).

Cho discloses a pitch determination apparatus that includes a formant bandwidth conversion [extension] unit (Fig. 2, element 210; Col. 1, line 61 – Col. 2, line 05; Col. 2, lines 63-65) for the purposes of extending formant bandwidth.

Arslan discloses bandwidth compression as applied above, but does not adequately disclose bandwidth expansion.

Dejaco in view of Cho and in further view of Arslan does not adequately disclose a separation of adaptive and fixed codebooks, a perceptual weighting filter before the codebook searching means.

Koa discloses a CELP vocoder that includes both an adaptive and fixed codebook (Fig. 4; Col. 5, lines 42-59), and also perceptual weighting filters before codebook searching (Fig. 4, items 66-68; Col. 5, line 69 – Col. 6, line 09).

These references are combinable because each is directed to a method of speech data analysis and also to encoding speech. Further, Cho provides motivation to combine in disclosing the utility of formant bandwidth extension in reducing the influence of a first formant, thus yielding a more accurate analysis (Col. 1, line 62).

Arslan further provides motivation in disclosing the usefulness of compression of formant bandwidth to remove audible buzz artifacts caused by overly-expanded formant bandwidths (Col. 8, lines 58-61).

Koa provides further motivation in disclosing the need for reduced complexity of processing the excitation parameters of a CELP-type codec (Col. 3, lines 42-45).

Therefore, the examiner contends that it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Dejaco in view of Cho to implement an apparatus for trans-coding between CELP type codecs including a formant bandwidth conversion device used for reducing the influence of a first formant in speech data, and to further use the teachings of Arslan to remove

audible buzz artifacts caused by overly-expanded formant bandwidths, and to further still use the teachings of Koa to reduce the complexity of processing the excitation parameters of a CELP-type codec.

Regarding **claim 7**, Dejaco in view of Cho, in further view of Arslan and in further view of Koa teaches all limitations of **claim 6** as applied above, and Arslan discloses the reduction of formant bandwidth by direct adjustment of line spectral frequencies, including a decimation method (use of "bandwidth adjustment ratio"; Col. 9, lines 06-15). Because the decimation is achieved using a bandwidth adjustment ratio, it would be obvious to adjust the ratio to achieve an interpolation [expansion] of formant bandwidth. Further, Arslan specifically discloses that excitation parameters can be transformed in the same manner as formant parameters (Col. 10, lines 18-21).

This limitation is directly related to the teachings of Arslan as applied above to **claim 6**, and therefore the motivation to combine the references is the same for **claim 7** as applied above to **claim 6**.

Regarding **claim 8**, this claim is very similar to **claim 1**, and is rejected for the same reasons.

Regarding **claim 9**, this claim is very similar to **claim 1**, and is rejected for the same reasons.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Kovacek whose telephone number is (571)270-3135. The examiner can normally be reached on M-F 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Talivaldis Ivars Smits/
Primary Examiner, Art Unit 2626

DMK, 10/16/2008